

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
NITK – Surathkal

CS204: Data Structures and Algorithms Lab

Assignment - 4

Instructions:

1. Implement the following exercise using C.
2. You are required to complete this exercise on or before 09/11/2021.
3. Submit all the programs in a single .zip file.

Exercise:

1. Write a program to implement the stack using
 - a. Arrays.
 - b. Linked Lists

The programs should include functions to perform the following operations:

Push: Inserts an element to the top of the stack

Pop: Deletes an element from the top of the stack

Display: Displays all the elements of the stack

2. Write a program to convert an infix expression to equivalent (i) postfix expression
(ii) prefix expression using stack
3. Write a program to evaluate the postfix expression.
4. Write a program to check the balanced brackets/parenthesis in an expression using stack
5. Write a program to implement the circular queue using
 - a. Arrays.
 - b. Linked Lists

The program should include functions to perform the following operations:

Enqueue: Inserts an element to the end of the queue

Dequeue: Removes an element from the front of the queue

Display: Displays all the elements of the queue

6. Write a program to implement the stack using queues
7. Write programs to implement the following sorting algorithms. For each of the sorting methods, count the number of comparisons required to sort.
 - a. Insertion sort
 - b. Merge sort
 - c. Quicksort
 - d. Bucket sort
 - e. Radix sort

8. Write programs to implement the following searching algorithms
 - a. Linear search
 - b. Binary search